



Company: Whiting Oil & Gas
Field: Weld Co., CO
Location: Sec.30-T10N-R57W
Well: Horsetail 30F-3106
Borehole: Original Hole
Rig: Xtreme 18
Plan: Rev 0



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	Begin Nudge
3	800.00	4.00	183.60	799.84	-6.96	-0.44	2.00	183.60	6.97	Hold Tangent
4	5058.00	4.00	183.60	5047.47	-303.40	-19.09	0.00	0.00	303.53	KOP, Build 11°/100' DLS
5	5839.82	90.00	183.60	5532.00	-821.98	-51.71	11.00	0.00	822.33	LP, Begin Turn
6	5959.85	90.00	180.00	5532.00	-941.93	-55.48	3.00	-90.00	942.30	EOT, Hold to TD
7	12687.95	90.00	180.00	5532.00	-7670.03	-55.38	0.00	0.00	7670.23	PBHL/TD

WELL DETAILS: Horsetail 30F-3106

+N/-S	+E/-W	GL 4780.00	KB @ 4797.00usft (Xtreme 18 17' KB)	Longitude
0.00	0.00	Northing 1542659.64	Easting 3471640.01	103° 47' 46.100 W
			Latitude 40° 48' 37.958 N	

WELLBORE TARGET DETAILS

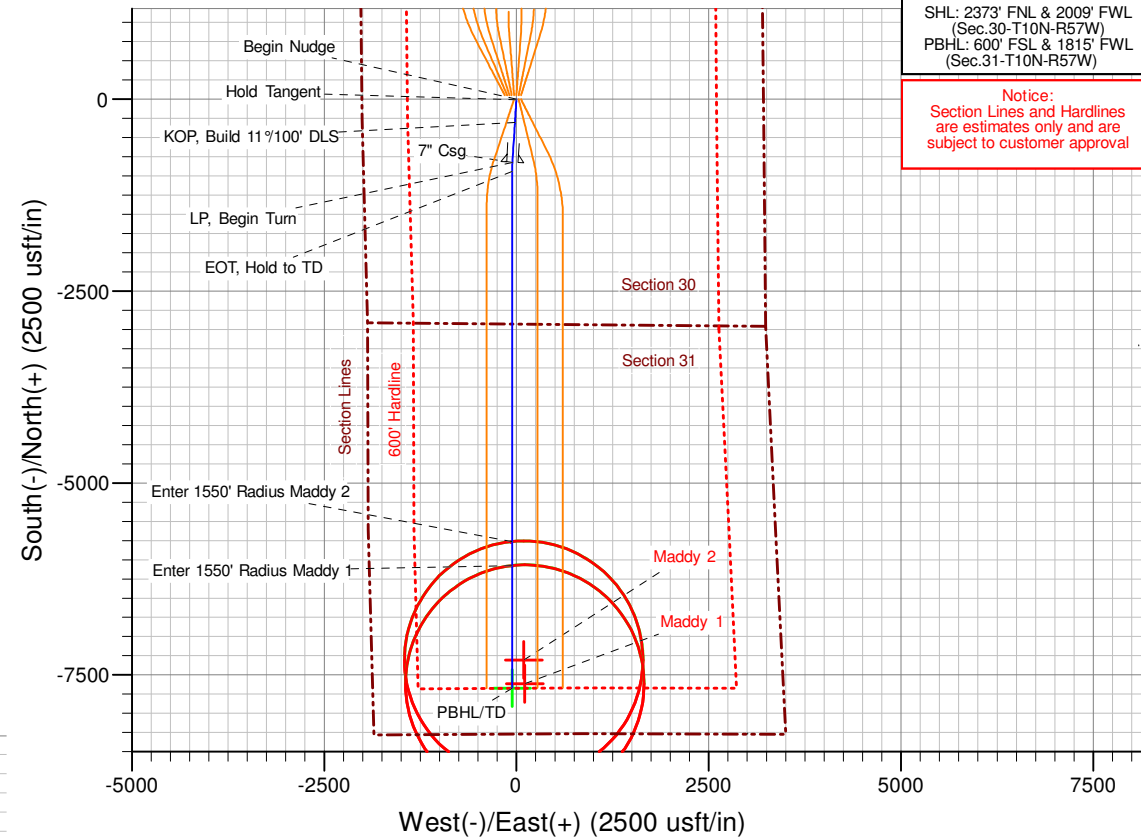
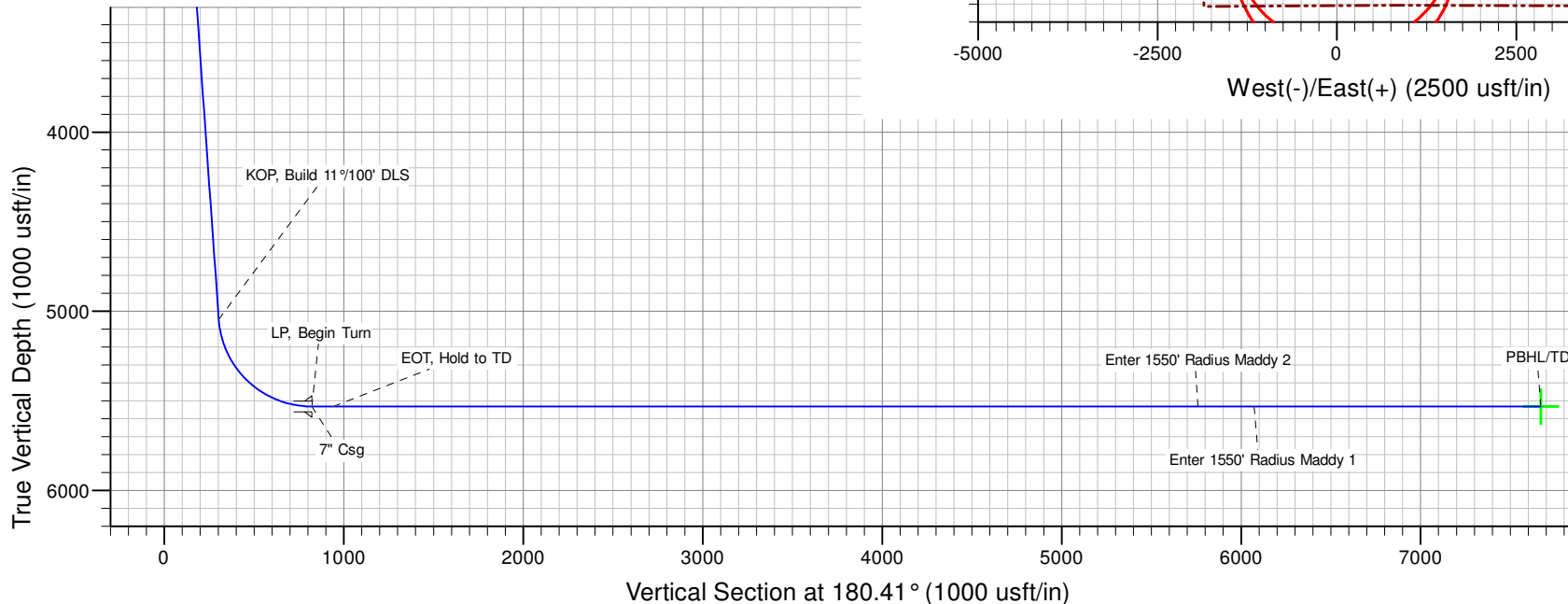
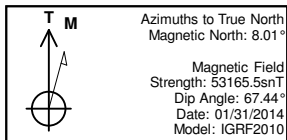
Name	TVD	+N/-S	+E/-W	Shape
PBHL Horsetail 30F-3106	5532.00	-7670.03	-55.38	Point
Maddy #1	6300.00	-7614.29	109.38	Circle (Radius: 1550.00)
Maddy #2	6500.00	-7302.78	95.81	Circle (Radius: 1550.00)

CASING DETAILS

TVD	MD	Name	Size
5532.00	5839.82	7" Csg	7

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
1498.00	1499.87	Pierre
1550.00	1551.99	Surface Casing
5469.00	5580.98	Niobrara
5532.00	5838.40	Target TVD



SHL: 2373' FNL & 2009' FWL (Sec.30-T10N-R57W)
PBHL: 600' FSL & 1815' FWL (Sec.31-T10N-R57W)

Notice:
Section Lines and Hardlines
are estimates only and are
subject to customer approval

7" Casing:
2101' FSL 1957' FWL
238' From Horsetail 30F-3105
273' From Horsetail 30F-3107

Enter Maddy 2
1550' Radius @ 10,778' MD
Enter Maddy 1
1550' Radius @ 11,091' MD



Whiting Oil & Gas

**Weld Co., CO
Sec.30-T10N-R57W
Horsetail 30F-3106**

Original Hole

Plan: Rev 0

Standard Planning Report

04 February, 2014



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Horsetail 30F-3106
Company:	Whiting Oil & Gas	TVD Reference:	KB @ 4797.00usft (Xtreme 18 17' KB)
Project:	Weld Co., CO	MD Reference:	KB @ 4797.00usft (Xtreme 18 17' KB)
Site:	Sec.30-T10N-R57W	North Reference:	True
Well:	Horsetail 30F-3106	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Project	Weld Co., CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site	Sec.30-T10N-R57W			
Site Position:		Northing:	1,542,707.40 usft	Latitude: 40° 48' 38.459 N
From:	Lat/Long	Easting:	3,471,489.02 usft	Longitude: 103° 47' 48.052 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: 1.10 °

Well	Horsetail 30F-3106			
Well Position	+N/-S	-50.65 usft	Northing:	1,542,659.64 usft
	+E/-W	150.04 usft	Easting:	3,471,640.01 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	4,797.00 usft	Ground Level: 4,780.00 usft

Wellbore	Original Hole				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	01/31/14	8.01	67.44	53,166

Design	Rev 0			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	180.41

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	
800.00	4.00	183.60	799.84	-6.96	-0.44	2.00	2.00	0.00	183.60	
5,058.00	4.00	183.60	5,047.47	-303.40	-19.09	0.00	0.00	0.00	0.00	
5,839.82	90.00	183.60	5,532.00	-821.98	-51.71	11.00	11.00	0.00	0.00	
5,959.85	90.00	180.00	5,532.00	-941.93	-55.48	3.00	0.00	-3.00	-90.00	
12,687.95	90.00	180.00	5,532.00	-7,670.03	-55.38	0.00	0.00	0.00	0.00	PBHL Horsetail 30F-3



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Horsetail 30F-3106
Company:	Whiting Oil & Gas	TVD Reference:	KB @ 4797.00usft (Xtreme 18 17' KB)
Project:	Weld Co., CO	MD Reference:	KB @ 4797.00usft (Xtreme 18 17' KB)
Site:	Sec.30-T10N-R57W	North Reference:	True
Well:	Horsetail 30F-3106	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Nudge									
700.00	2.00	183.60	699.98	-1.74	-0.11	1.74	2.00	2.00	0.00
800.00	4.00	183.60	799.84	-6.96	-0.44	6.97	2.00	2.00	0.00
Hold Tangent									
900.00	4.00	183.60	899.59	-13.93	-0.88	13.93	0.00	0.00	0.00
1,000.00	4.00	183.60	999.35	-20.89	-1.31	20.90	0.00	0.00	0.00
1,100.00	4.00	183.60	1,099.11	-27.85	-1.75	27.86	0.00	0.00	0.00
1,200.00	4.00	183.60	1,198.86	-34.81	-2.19	34.83	0.00	0.00	0.00
1,300.00	4.00	183.60	1,298.62	-41.77	-2.63	41.79	0.00	0.00	0.00
1,400.00	4.00	183.60	1,398.38	-48.74	-3.07	48.76	0.00	0.00	0.00
1,499.87	4.00	183.60	1,498.00	-55.69	-3.50	55.71	0.00	0.00	0.00
Pierre									
1,500.00	4.00	183.60	1,498.13	-55.70	-3.50	55.72	0.00	0.00	0.00
1,551.99	4.00	183.60	1,550.00	-59.32	-3.73	59.34	0.00	0.00	0.00
Surface Casing									
1,600.00	4.00	183.60	1,597.89	-62.66	-3.94	62.69	0.00	0.00	0.00
1,700.00	4.00	183.60	1,697.65	-69.62	-4.38	69.65	0.00	0.00	0.00
1,800.00	4.00	183.60	1,797.40	-76.58	-4.82	76.62	0.00	0.00	0.00
1,900.00	4.00	183.60	1,897.16	-83.55	-5.26	83.58	0.00	0.00	0.00
2,000.00	4.00	183.60	1,996.91	-90.51	-5.69	90.55	0.00	0.00	0.00
2,100.00	4.00	183.60	2,096.67	-97.47	-6.13	97.51	0.00	0.00	0.00
2,200.00	4.00	183.60	2,196.43	-104.43	-6.57	104.48	0.00	0.00	0.00
2,300.00	4.00	183.60	2,296.18	-111.39	-7.01	111.44	0.00	0.00	0.00
2,400.00	4.00	183.60	2,395.94	-118.35	-7.45	118.41	0.00	0.00	0.00
2,500.00	4.00	183.60	2,495.70	-125.32	-7.88	125.37	0.00	0.00	0.00
2,600.00	4.00	183.60	2,595.45	-132.28	-8.32	132.34	0.00	0.00	0.00
2,700.00	4.00	183.60	2,695.21	-139.24	-8.76	139.30	0.00	0.00	0.00
2,800.00	4.00	183.60	2,794.97	-146.20	-9.20	146.26	0.00	0.00	0.00
2,900.00	4.00	183.60	2,894.72	-153.16	-9.64	153.23	0.00	0.00	0.00
3,000.00	4.00	183.60	2,994.48	-160.13	-10.07	160.19	0.00	0.00	0.00
3,100.00	4.00	183.60	3,094.23	-167.09	-10.51	167.16	0.00	0.00	0.00
3,200.00	4.00	183.60	3,193.99	-174.05	-10.95	174.12	0.00	0.00	0.00
3,300.00	4.00	183.60	3,293.75	-181.01	-11.39	181.09	0.00	0.00	0.00
3,400.00	4.00	183.60	3,393.50	-187.97	-11.83	188.05	0.00	0.00	0.00
3,500.00	4.00	183.60	3,493.26	-194.94	-12.26	195.02	0.00	0.00	0.00
3,600.00	4.00	183.60	3,593.02	-201.90	-12.70	201.98	0.00	0.00	0.00
3,700.00	4.00	183.60	3,692.77	-208.86	-13.14	208.95	0.00	0.00	0.00
3,800.00	4.00	183.60	3,792.53	-215.82	-13.58	215.91	0.00	0.00	0.00
3,900.00	4.00	183.60	3,892.29	-222.78	-14.02	222.88	0.00	0.00	0.00
4,000.00	4.00	183.60	3,992.04	-229.74	-14.45	229.84	0.00	0.00	0.00
4,100.00	4.00	183.60	4,091.80	-236.71	-14.89	236.81	0.00	0.00	0.00
4,200.00	4.00	183.60	4,191.56	-243.67	-15.33	243.77	0.00	0.00	0.00
4,300.00	4.00	183.60	4,291.31	-250.63	-15.77	250.74	0.00	0.00	0.00
4,400.00	4.00	183.60	4,391.07	-257.59	-16.21	257.70	0.00	0.00	0.00
4,500.00	4.00	183.60	4,490.82	-264.55	-16.64	264.67	0.00	0.00	0.00
4,600.00	4.00	183.60	4,590.58	-271.52	-17.08	271.63	0.00	0.00	0.00
4,700.00	4.00	183.60	4,690.34	-278.48	-17.52	278.60	0.00	0.00	0.00



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Company:	Whiting Oil & Gas	TVD Reference:	KB @ 4797.00usft (Xtreme 18 17' KB)
Project:	Weld Co., CO	MD Reference:	KB @ 4797.00usft (Xtreme 18 17' KB)
Site:	Sec.30-T10N-R57W	North Reference:	True
Well:	Horsetail 30F-3106	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,800.00	4.00	183.60	4,790.09	-285.44	-17.96	285.56	0.00	0.00	0.00
4,900.00	4.00	183.60	4,889.85	-292.40	-18.40	292.53	0.00	0.00	0.00
5,000.00	4.00	183.60	4,989.61	-299.36	-18.83	299.49	0.00	0.00	0.00
5,058.00	4.00	183.60	5,047.47	-303.40	-19.09	303.53	0.00	0.00	0.00
KOP, Build 11°/100' DLS									
5,100.00	8.62	183.60	5,089.20	-308.01	-19.38	308.14	11.00	11.00	0.00
5,200.00	19.62	183.60	5,186.03	-332.32	-20.91	332.46	11.00	11.00	0.00
5,300.00	30.62	183.60	5,276.43	-374.62	-23.57	374.78	11.00	11.00	0.00
5,400.00	41.62	183.60	5,357.09	-433.36	-27.26	433.55	11.00	11.00	0.00
5,500.00	52.62	183.60	5,425.03	-506.38	-31.86	506.60	11.00	11.00	0.00
5,580.98	61.53	183.60	5,469.00	-574.15	-36.12	574.39	11.00	11.00	0.00
Niobrara									
5,600.00	63.62	183.60	5,477.76	-591.00	-37.18	591.25	11.00	11.00	0.00
5,700.00	74.62	183.60	5,513.35	-684.11	-43.04	684.40	11.00	11.00	0.00
5,800.00	85.62	183.60	5,530.48	-782.28	-49.22	782.61	11.00	11.00	0.00
5,838.40	89.84	183.60	5,532.00	-820.57	-51.63	820.92	11.00	11.00	0.00
Target TVD									
5,839.82	90.00	183.60	5,532.00	-821.98	-51.71	822.33	10.99	10.99	0.00
LP, Begin Turn - 7" Csg									
5,900.00	90.00	181.79	5,532.00	-882.09	-54.55	882.46	3.00	0.00	-3.00
5,959.85	90.00	180.00	5,532.00	-941.93	-55.48	942.30	3.00	0.00	-3.00
EOT, Hold to TD									
6,000.00	90.00	180.00	5,532.00	-982.08	-55.48	982.46	0.00	0.00	0.00
6,100.00	90.00	180.00	5,532.00	-1,082.08	-55.48	1,082.45	0.00	0.00	0.00
6,200.00	90.00	180.00	5,532.00	-1,182.08	-55.48	1,182.45	0.00	0.00	0.00
6,300.00	90.00	180.00	5,532.00	-1,282.08	-55.48	1,282.45	0.00	0.00	0.00
6,400.00	90.00	180.00	5,532.00	-1,382.08	-55.48	1,382.45	0.00	0.00	0.00
6,500.00	90.00	180.00	5,532.00	-1,482.08	-55.48	1,482.44	0.00	0.00	0.00
6,600.00	90.00	180.00	5,532.00	-1,582.08	-55.47	1,582.44	0.00	0.00	0.00
6,700.00	90.00	180.00	5,532.00	-1,682.08	-55.47	1,682.44	0.00	0.00	0.00
6,800.00	90.00	180.00	5,532.00	-1,782.08	-55.47	1,782.44	0.00	0.00	0.00
6,900.00	90.00	180.00	5,532.00	-1,882.08	-55.47	1,882.43	0.00	0.00	0.00
7,000.00	90.00	180.00	5,532.00	-1,982.08	-55.47	1,982.43	0.00	0.00	0.00
7,100.00	90.00	180.00	5,532.00	-2,082.08	-55.47	2,082.43	0.00	0.00	0.00
7,200.00	90.00	180.00	5,532.00	-2,182.08	-55.46	2,182.42	0.00	0.00	0.00
7,300.00	90.00	180.00	5,532.00	-2,282.08	-55.46	2,282.42	0.00	0.00	0.00
7,400.00	90.00	180.00	5,532.00	-2,382.08	-55.46	2,382.42	0.00	0.00	0.00
7,500.00	90.00	180.00	5,532.00	-2,482.08	-55.46	2,482.42	0.00	0.00	0.00
7,600.00	90.00	180.00	5,532.00	-2,582.08	-55.46	2,582.41	0.00	0.00	0.00
7,700.00	90.00	180.00	5,532.00	-2,682.08	-55.46	2,682.41	0.00	0.00	0.00
7,800.00	90.00	180.00	5,532.00	-2,782.08	-55.46	2,782.41	0.00	0.00	0.00
7,900.00	90.00	180.00	5,532.00	-2,882.08	-55.45	2,882.41	0.00	0.00	0.00
8,000.00	90.00	180.00	5,532.00	-2,982.08	-55.45	2,982.40	0.00	0.00	0.00
8,100.00	90.00	180.00	5,532.00	-3,082.08	-55.45	3,082.40	0.00	0.00	0.00
8,200.00	90.00	180.00	5,532.00	-3,182.08	-55.45	3,182.40	0.00	0.00	0.00
8,300.00	90.00	180.00	5,532.00	-3,282.08	-55.45	3,282.40	0.00	0.00	0.00
8,400.00	90.00	180.00	5,532.00	-3,382.08	-55.45	3,382.39	0.00	0.00	0.00
8,500.00	90.00	180.00	5,532.00	-3,482.08	-55.44	3,482.39	0.00	0.00	0.00
8,600.00	90.00	180.00	5,532.00	-3,582.08	-55.44	3,582.39	0.00	0.00	0.00
8,700.00	90.00	180.00	5,532.00	-3,682.08	-55.44	3,682.39	0.00	0.00	0.00
8,800.00	90.00	180.00	5,532.00	-3,782.08	-55.44	3,782.38	0.00	0.00	0.00
8,900.00	90.00	180.00	5,532.00	-3,882.08	-55.44	3,882.38	0.00	0.00	0.00
9,000.00	90.00	180.00	5,532.00	-3,982.08	-55.44	3,982.38	0.00	0.00	0.00



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Project:	Weld Co., CO	MD Reference:	KB @ 4797.00usft (Xtreme 18 17' KB)
Site:	Sec.30-T10N-R57W	North Reference:	True
Well:	Horsetail 30F-3106	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,100.00	90.00	180.00	5,532.00	-4,082.08	-55.44	4,082.38	0.00	0.00	0.00
9,200.00	90.00	180.00	5,532.00	-4,182.08	-55.43	4,182.37	0.00	0.00	0.00
9,300.00	90.00	180.00	5,532.00	-4,282.08	-55.43	4,282.37	0.00	0.00	0.00
9,400.00	90.00	180.00	5,532.00	-4,382.08	-55.43	4,382.37	0.00	0.00	0.00
9,500.00	90.00	180.00	5,532.00	-4,482.08	-55.43	4,482.36	0.00	0.00	0.00
9,600.00	90.00	180.00	5,532.00	-4,582.08	-55.43	4,582.36	0.00	0.00	0.00
9,700.00	90.00	180.00	5,532.00	-4,682.08	-55.43	4,682.36	0.00	0.00	0.00
9,800.00	90.00	180.00	5,532.00	-4,782.08	-55.43	4,782.36	0.00	0.00	0.00
9,900.00	90.00	180.00	5,532.00	-4,882.08	-55.42	4,882.35	0.00	0.00	0.00
10,000.00	90.00	180.00	5,532.00	-4,982.08	-55.42	4,982.35	0.00	0.00	0.00
10,100.00	90.00	180.00	5,532.00	-5,082.08	-55.42	5,082.35	0.00	0.00	0.00
10,200.00	90.00	180.00	5,532.00	-5,182.08	-55.42	5,182.35	0.00	0.00	0.00
10,300.00	90.00	180.00	5,532.00	-5,282.08	-55.42	5,282.34	0.00	0.00	0.00
10,400.00	90.00	180.00	5,532.00	-5,382.08	-55.42	5,382.34	0.00	0.00	0.00
10,500.00	90.00	180.00	5,532.00	-5,482.08	-55.41	5,482.34	0.00	0.00	0.00
10,600.00	90.00	180.00	5,532.00	-5,582.08	-55.41	5,582.34	0.00	0.00	0.00
10,700.00	90.00	180.00	5,532.00	-5,682.08	-55.41	5,682.33	0.00	0.00	0.00
10,778.00	90.00	180.00	5,532.00	-5,760.08	-55.41	5,760.33	0.00	0.00	0.00
Enter 1550' Radius Maddy 2									
10,800.00	90.00	180.00	5,532.00	-5,782.08	-55.41	5,782.33	0.00	0.00	0.00
10,900.00	90.00	180.00	5,532.00	-5,882.08	-55.41	5,882.33	0.00	0.00	0.00
11,000.00	90.00	180.00	5,532.00	-5,982.08	-55.41	5,982.33	0.00	0.00	0.00
11,091.00	90.00	180.00	5,532.00	-6,073.08	-55.41	6,073.32	0.00	0.00	0.00
Enter 1550' Radius Maddy 1									
11,100.00	90.00	180.00	5,532.00	-6,082.08	-55.41	6,082.32	0.00	0.00	0.00
11,200.00	90.00	180.00	5,532.00	-6,182.08	-55.40	6,182.32	0.00	0.00	0.00
11,300.00	90.00	180.00	5,532.00	-6,282.08	-55.40	6,282.32	0.00	0.00	0.00
11,400.00	90.00	180.00	5,532.00	-6,382.08	-55.40	6,382.31	0.00	0.00	0.00
11,500.00	90.00	180.00	5,532.00	-6,482.08	-55.40	6,482.31	0.00	0.00	0.00
11,600.00	90.00	180.00	5,532.00	-6,582.08	-55.40	6,582.31	0.00	0.00	0.00
11,700.00	90.00	180.00	5,532.00	-6,682.08	-55.40	6,682.31	0.00	0.00	0.00
11,800.00	90.00	180.00	5,532.00	-6,782.08	-55.40	6,782.30	0.00	0.00	0.00
11,900.00	90.00	180.00	5,532.00	-6,882.08	-55.39	6,882.30	0.00	0.00	0.00
12,000.00	90.00	180.00	5,532.00	-6,982.08	-55.39	6,982.30	0.00	0.00	0.00
12,100.00	90.00	180.00	5,532.00	-7,082.08	-55.39	7,082.30	0.00	0.00	0.00
12,200.00	90.00	180.00	5,532.00	-7,182.08	-55.39	7,182.29	0.00	0.00	0.00
12,300.00	90.00	180.00	5,532.00	-7,282.08	-55.39	7,282.29	0.00	0.00	0.00
12,400.00	90.00	180.00	5,532.00	-7,382.08	-55.39	7,382.29	0.00	0.00	0.00
12,500.00	90.00	180.00	5,532.00	-7,482.08	-55.38	7,482.29	0.00	0.00	0.00
12,600.00	90.00	180.00	5,532.00	-7,582.08	-55.38	7,582.28	0.00	0.00	0.00
12,687.95	90.00	180.00	5,532.00	-7,670.03	-55.38	7,670.23	0.00	0.00	0.00
PBHL/TD									



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well Horsetail 30F-3106
Company:	Whiting Oil & Gas	TVD Reference:	KB @ 4797.00usft (Xtreme 18 17' KB)
Project:	Weld Co., CO	MD Reference:	KB @ 4797.00usft (Xtreme 18 17' KB)
Site:	Sec.30-T10N-R57W	North Reference:	True
Well:	Horsetail 30F-3106	Survey Calculation Method:	Minimum Curvature
Wellbore:	Original Hole		
Design:	Rev 0		

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
PBHL Horsetail 30F-310	0.00	0.00	5,532.00	-7,670.03	-55.38	1,534,989.97	3,471,732.00	40° 47' 22.171 N	103° 47' 46.820 W
- plan hits target center									
- Point									
Maddy #1	0.00	0.00	6,300.00	-7,614.29	109.38	1,535,048.86	3,471,895.66	40° 47' 22.722 N	103° 47' 44.678 W
- plan misses target center by 786.13usft at 12600.00usft MD (5532.00 TVD, -7582.08 N, -55.38 E)									
- Circle (radius 1,550.00)									
Maddy #2	0.00	0.00	6,500.00	-7,302.78	95.81	1,535,360.05	3,471,876.11	40° 47' 25.800 N	103° 47' 44.855 W
- plan misses target center by 979.74usft at 12320.70usft MD (5532.00 TVD, -7302.78 N, -55.39 E)									
- Circle (radius 1,550.00)									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
5,839.82	5,532.00	7" Csg	7	7-1/2

Formations					
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,499.87	1,498.00	Pierre		0.00	
1,551.99	1,550.00	Surface Casing		0.00	
5,580.98	5,469.00	Niobrara		0.00	
5,838.40	5,532.00	Target TVD		0.00	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
600.00	600.00	0.00	0.00	Begin Nudge
800.00	799.84	-6.96	-0.44	Hold Tangent
5,058.00	5,047.47	-303.40	-19.09	KOP, Build 11°/100' DLS
5,839.82	5,532.00	-821.98	-51.71	LP, Begin Turn
5,959.85	5,532.00	-941.93	-55.48	EOT, Hold to TD
10,778.00	5,532.00	-5,760.08	-55.41	Enter 1550' Radius Maddy 2
11,091.00	5,532.00	-6,073.08	-55.41	Enter 1550' Radius Maddy 1
12,687.95	5,532.00	-7,670.03	-55.38	PBHL/TD